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No one could detect sweetness in amyl alcohol, and many could not in butyl. These results, however, are so nearly the same, and the errors of observation so great, that it may be considered that the sweetness of methyl, ethyl, and propyl alcohols is about the same; that butyl is very slightly sweet, and amyl not at all.

The second series was that represented by  $C_n H_{2n+2}O_n$ . The results were as follows:

Methyl alcohol $CH_3OH$	.....	1 part in 45.
Glycol $C_2H_4(OH)_2$	.....	1 part in 124.
Glycerine $C_3H_5(OH)_3$	.....	1 part in 155.
Erythrite $C_4H_6(OH)_4$	.....	1 part in 225.
Pentatomic alcohol, unknown.		
Mannite $C_6H_8(OH)_6$	.....	1 part in 85.

From this it appears that the sweetness increases with each additional hydroxyl group for the first four, but that mannite is much less sweet than might have been expected, from its position and its relation to all our sugars, the carbo-hydrates.

#### NOTES ON SOME KANSAS METEORITES.

BY F. H. SNOW, LAWRENCE.

The description of the Kiowa county, Kan., meteorites is published in full in *Science*, vol. XVI, May 9, and July 18, 1890.

Also a description of the Washington county, Kan., meteorite, may be found in *Science*, vol. XVI, July 18, 1890.

#### ADDITIONS TO THE FLORA OF KANSAS.

BY E. B. SMYTH, TOPEKA.

It is fourteen years since anything like a complete list of the plants of Kansas has been published. This was done by Prof. J. H. Carruth, of Lawrence. The list contained the names of 1,082 plants. Additions made since then have increased the list to 1,515 numbers. The last addition was made in 1884.

Botanical researches through the State since then, have thrown some light on the published lists, and have disclosed some new plants. Some of the plants named in those lists have not since been seen, and are not positively known to be growing in the State. The following need confirmation, and should be erased from the list of Kansas plants:

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|------------------------------------|-------------------------------------|
| 1. <i>Corydalis montana</i> .      | 11. <i>Malvastrum pedatifidum</i> . |
| 2. <i>Nasturtium officinale</i> .  | 12. <i>Hibiscus carolinianus</i> .  |
| 3. <i>Hypericum ellipticum</i> .   | 13. <i>Psoralea eglandulosa</i> .   |
| 4. <i>Hypericum gymnanthemum</i> . | 14. <i>Psoralea scabra</i> .        |
| 5. <i>Hypericum canadense</i> .    | 15. <i>Astragalus goniatus</i> .    |
| 6. <i>Hypericum angulosum</i> .    | 16. <i>Astragalus campestris</i> .  |
| 7. <i>Alsine brevifolia</i> .      | 17. <i>Lathyrus pusillus</i> .      |
| 8. <i>Agrostemma githago</i> .     | 18. <i>Desmodium neglectum</i> .    |
| 9. <i>Paronychia canadensis</i> .  | 19. <i>Crataegus parviflora</i> .   |
| 10. <i>Malvastrum angustum</i> .   | 20. <i>Crataegus sanguinea</i> .    |

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|--------------------------------------|--------------------------------------|
| 21. <i>Ribes lacustre.</i>           | 72. <i>Pentstemon fendleri.</i>      |
| 22. <i>Ammannia nuttallii.</i>       | 73. <i>Pentstemon brandegeei.</i>    |
| 23. <i>Proserpinaca pectinacea.</i>  | 74. <i>Salvia azurea.</i>            |
| 24. <i>Ludwigia arcuata.</i>         | 75. <i>Heliophytum indicum.</i>      |
| 25. <i>Oenothera bicolor.</i>        | 76. <i>Phaeelia hirsuta.</i>         |
| 26. <i>Gaura longifolia.</i>         | 77. <i>Gilia linearis.</i>           |
| 27. <i>Chærophyllum tainturieri.</i> | 78. <i>Phlox carolina.</i>           |
| 28. <i>Eriogonum bulbosa.</i>        | 79. <i>Batatas macrorhiza.</i>       |
| 29. <i>Ligusticum acteifolium.</i>   | 80. <i>Evolvulus sericeus.</i>       |
| 30. <i>Vernonia scaberrima.</i>      | 81. <i>Physalis heterophylla.</i>    |
| 31. <i>Liatris paniculata.</i>       | 82. <i>Physalis nyctaginea.</i>      |
| 32. <i>Eupatorium aromaticum.</i>    | 83. <i>Physalis pennsylvanica.</i>   |
| 33. <i>Aster concolor.</i>           | 84. <i>Physalis rhomboidea.</i>      |
| 34. <i>Aster squarrosus.</i>         | 85. <i>Physalis mollis.</i>          |
| 35. <i>Aster mutabilis.</i>          | 86. <i>Physalis viscosa.</i>         |
| 36. <i>Aster nemoralis.</i>          | 87. <i>Solanum sisymbriifolium.</i>  |
| 37. <i>Aster novi-belgii.</i>        | 88. <i>Sabbatia gracilis.</i>        |
| 38. <i>Solidago latifolia.</i>       | 89. <i>Gœnolobus obliquus.</i>       |
| 39. <i>Solidago discoidea.</i>       | 90. <i>Fraxinus platycarpa.</i>      |
| 40. <i>Solidago stricta.</i>         | 91. <i>Eriogonum tomentosum.</i>     |
| 41. <i>Solidago rupestris.</i>       | 92. <i>Euphorbia cordifolia.</i>     |
| 42. <i>Solidago angustata.</i>       | 93. <i>Euphorbia curtisii.</i>       |
| 43. <i>Solidago incana.</i>          | 94. <i>Celtis crassifolia.</i>       |
| 44. <i>Solidago squarrosa.</i>       | 95. <i>Quercus laurifolia.</i>       |
| 45. <i>Solidago virga-aurea.</i>     | 96. <i>Quercus falcata.</i>          |
| 46. <i>Solidago puberula.</i>        | 97. <i>Quercus castanea.</i>         |
| 47. <i>Solidago ulmifolia.</i>       | 98. <i>Salix myricoides.</i>         |
| 48. <i>Solidago asperrima.</i>       | 99. <i>Sagittaria simplex.</i>       |
| 49. <i>Diaperia prolifera.</i>       | 100. <i>Lachnanthes tinctoria.</i>   |
| 50. <i>Isopappus divaricatus.</i>    | 101. <i>Erythronium propullans.</i>  |
| 51. <i>Helianthus microcephalus.</i> | 102. <i>Smilax tamnifolia.</i>       |
| 52. <i>Helianthus nocoletti.</i>     | 103. <i>Smilax peduncularis.</i>     |
| 53. <i>Silphium laevigatum.</i>      | 104. <i>Zygadenus leimanthoides.</i> |
| 54. <i>Silphium asperrimum.</i>      | 105. <i>Heteranthera limosa.</i>     |
| 55. <i>Silphium asteriscus.</i>      | 106. <i>Juncus stygius.</i>          |
| 56. <i>Coreopsis discoidea.</i>      | 107. <i>Juncus polyccephalus.</i>    |
| 57. <i>Bidens tenuisecta.</i>        | 108. <i>Juncus greenii.</i>          |
| 58. <i>Echinacea atrorubens.</i>     | 109. <i>Commelynna communis.</i>     |
| 59. <i>Verbesina sinuata.</i>        | 110. <i>Cyperus compressus.</i>      |
| 60. <i>Verbesina virginica.</i>      | 111. <i>Cyperus glomuliferus.</i>    |
| 61. <i>Helenium tenuifolium.</i>     | 112. <i>Cyperus nuttallii.</i>       |
| 62. <i>Helenium quadridentatum.</i>  | 113. <i>Cyperus stenolepis.</i>      |
| 63. <i>Senecio anonymus.</i>         | 114. <i>Eleocharis olivacea.</i>     |
| 64. <i>Senecio longilobus.</i>       | 115. <i>Scirpus divaricatus.</i>     |
| 65. <i>Senecio lobatus.</i>          | 116. <i>Scirpus linearis.</i>        |
| 66. <i>Senecio vulgaris.</i>         | 117. <i>Fimbristylis laxa.</i>       |
| 67. <i>Cirsium ochrocentrum.</i>     | 118. <i>Carex cristata.</i>          |
| 68. <i>Tetradymia —.</i>             | 119. <i>Carex trisperma.</i>         |
| 69. <i>Specularia ludoviciana.</i>   | 120. <i>Carex argyrantha.</i>        |
| 70. <i>Gaylussacia resinosa.</i>     | 121. <i>Carex festucacea.</i>        |
| 71. <i>Utricularia gibba.</i>        | 122. <i>Carex adusta.</i>            |

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| 123. <i>Carex æstivalis</i> .        | 135. <i>Panicum serotinum</i> .       |
| 124. <i>Carex præcox</i> .           | 136. <i>Panicum villosum</i> .        |
| 125. <i>Carex novæ-angliæ</i> .      | 137. <i>Panicum xanthophysum</i> .    |
| 126. <i>Carex panicea</i> .          | 138. <i>Paspalum virgatum</i> .       |
| 127. <i>Carex polymorpha</i> .       | 139. <i>Alopecurus alpinus</i> .      |
| 128. <i>Carex schweinitzii</i> .     | 140. <i>Glyceria acutiflora</i> .     |
| 129. <i>Sporobolus longifolius</i> . | 141. <i>Glyceria aquatica</i> .       |
| 130. <i>Sporobolus indicus</i> .     | 142. <i>Glyceria elongata</i> .       |
| 131. <i>Sporobolus montanus</i> .    | 143. <i>Andropogon tener</i> .        |
| 132. <i>Agrostis elata</i> .         | 144. <i>Andropogon tetrastychus</i> . |
| 133. <i>Panicum amarum</i> .         | 145. <i>Andropogon torreyanus</i> .   |
| 134. <i>Panicum pubescens</i> .      |                                       |

To the above 145 species are to be added 15, that have been duplicated under the same or different names, making 160 that need to be deducted from the list as published; leaving net 1,355 species of plants in Kansas, omitting fungi.

Now, to that list as thus published is to be added the following, which is the result of the collections of the past ten years or upward. The following persons have contributed materially to this collection:

Dr. F. H. Snow, University of Kansas; Dr. J. H. Oyster, Paola; Prof. John Wherrell, Paola (also Leavenworth); Hon. Joel Moody, Mound City; Dr. W. S. Newlon, Oswego; Miss L. Cooper, Labette; Prof. E. N. Plank, Kansas City, Mo., (flora of Montgomery county); Prof. L. G. A. Copley, formerly of Wichita; Prof. M. A. Carleton, Garfield University, Wichita; Prof. O. F. McKim, Wellington; Prof. T. W. Corey, late of Conway Springs, Sumner county; Prof. Ansel Gridley, jr., Kingman; Chas. E. Hall, Hutchinson; Mrs. M. A. Moses, Great Bend, (now dead); C. C. Webb, Larned; Miss Dora Jackson, Arkalon, Seward county; Mrs. James Jackson, Golden, Grant county; Ansel Gridley, Esq., Richfield, Morton county; J. W. Stailey, Garden City, Hutchison and Topeka, (now of Lawrence); Prof. W. E. Castle, Ottawa University; Prof. Z. T. Riley, Topeka, (Greenwood county); H. E. Kinear, Topeka, (Emporia and Lyon county); Rev. Loren Armsby and Dr. H. M. Byers, Council Grove; Joseph Henry, Salina, (now dead); Supt. J. R. Bickerdyke, Russell; Dr. Louis Watson, Ellis; E. Bartholomew, Rockport, Rooks county; J. M. Waterman, Delphos, Ottawa county; Prof. E. A. Popenoë, State Agricultural College, Manhattan; F. F. Crevecoeur, Onaga; Paul Wilkinson, Seneca; Prof. A. M. Nissen, late of Wetmore; Mrs. A. L. Slosson and Dr. R. J. Brown, Leavenworth; H. C. Fellow, Tonganoxie; Prof. J. H. Carruth, Dr. W. H. Saunders and Dr. A. P. Fellows, Lawrence; Prof. F. W. and Mrs. Cragin and Miss Eunice Lyman, Washburn College, Topeka; Mrs. Omar Newman, Mrs. Geo. L. Epps, Mrs. A. H. Merrell, Miss Julia Huntoon, Miss Fannie Rowley, Wm. Smith, sr., and A. T. Daniels, all of Topeka.

I am especially indebted to Prof. W. A. Kellerman, who has collected in all parts of the State and reported many plants from various points, especially in the western portion of the State, and two years ago published a complete list of the grasses, which list stands to-day with very few changes.

I am also under great obligations to Dr. Geo. Vasey, of Washington, D. C., for valuable corrections and suggestions.

Of the additions here presented, a few need confirmation, but are included because they are reported from Kansas, and are believed to exist there. Specimens of all have not been seen by me; yet very nearly all are believed to be veritable. A trip into Doniphan and Atchison counties, and three trips made by me during the past year into the western and southern parts of the State, in which nearly every county south of the Arkansas was visited, have thrown much light on the distribu-

tion of some species, and added a few new to Kansas. A few names heretofore published are here included because the locality is now made definite.

The following is the list of additions to the Kansas flora:

FLOWERING PLANTS.

1. *Clematis ligusticifolia* Nuttall: Phillips county.
2. *Ranunculus cymbalaria* Pursh: Muddy sand-bars of the Arkansas, from Garden City down.
3. *Ranunculus multifidus* Psh., var. *terrestris* Gray: Same habitat.
4. *Thalictrum dioicum* L.: White Cloud.
5. *Thalictrum purpurascens* L.: Shawnee county.
6. *Argemone platyceras* Link & Otto: From Manhattan west and south throughout Kansas.
7. *Adlumia cirrhosa* Rafinesque: Linn county.
8. *Corydalis aurea* Willdenow: Topeka; Council Grove; Ellis.
9. *Corydalis micrantha* Gr.: Topeka, Council Grove.
10. *Brassica campestris* L., as described by Wood in B. & F.: Topeka.
11. *Biscutella wislizeni* Bentham & Hooker: Liberal.
12. *Erysimum asperum* DC.: Clay county.
13. *Erysimum parviflorum* Nutt.: Wallace county.
14. *Nasturtium armoracia* Fries: Topeka (escaped and run wild.)
15. *Nasturtium lacustre* Gray: Sand-bars of the Kaw, Manhattan to Topeka.
16. *Raphanus sativus* L.: Topeka (escaped).
17. *Cleome integrifolia* T. & G.: Undoubtedly native and very abundant everywhere west and south from Hutchinson, forming vast fields in places on barren prairies.
18. *Cleomella angustifolia* Torr.: Hutchinson; Great Bend; Meade; Coolidge.
19. *Cristatella jamesii* T. & G.: From Pratt west and south.
20. *Viola blanda* Willd: Shawnee county.
21. *Viola tricolor* L., var. *tenella* Vasey: Manhattan; Council Grove; El Dorado; Wichita.
22. *Arenaria lateriflora* L.: Nemaha and Atchison counties.
23. *Sagina decumbens* T. & G.: Shawnee county.
24. *Stellaria longifolia* L.: Shawnee county.
25. *Rhamnus alnifolia* L'Her.: Atchison.
26. *Astragalus adsurgens* Pallas: Barton, Pawnee and Finney counties.
27. *Astragalus cæspitosus* Gray: Wallace county.
28. *Astragalus flexuosus* Douglas: Ellis and Ford counties.
29. *Astragalus hypoglottis* L.: Barton and Cherokee counties.
30. *Astragalus multiflorus* Gr.: Ellis county.
31. *Astragalus parryi* Gr.: Ellis and Meade counties.
32. *Astragalus scopulorus* Porter: Arkansas City.
33. *Dalea formosa* Torr: Rooks county.
34. *Dalea lanata* Sprengel: Gray and Meade counties, and west.
35. *Desmanthus leptolobus* T. & G.: Shawnee, Saline, and Barton counties.
36. *Desmodium nudiflorum* DC.: Topeka; Council Grove.
37. *Desmodium rotundifolium* DC.: Atchison; Valley Falls; Topeka.
38. *Desmodium viridiflorum* Beck: Shawnee county.
39. *Hoffmannseggia jamesii* T. & G.: Garden City; Arkalon.
40. *Lathyrus polymorphus* Nutt.: Manhattan.
41. *Lathyrus venosus* Muhl.: Council Grove.
42. *Petalostemon gracilis* N.: Garden City to Arkalon and west.

43. *Psoralea campestris* Nutt.: Barton and Stafford counties; Meade county.
44. *Trifolium hybridum* L.: Shawnee county (introduced).
45. *Vicia micrantha* N.: Southwest Kansas (Prof. Kellerman).
46. *Physocarpus opulifolius* Max.: Miami county.
47. *Potentilla anserina* L.: Western Kansas (Prof. Popenoe).
48. *Potentilla arguta* Psh.: Northwest Kansas (Kellerman).
49. *Potentilla gracilis* Dougl.: Topeka (very rare—probably a stray).
50. *Potentilla hippiana* Lehm.: Northwest Kansas.
51. *Potentilla pensylvanica* L.: Shawnee county.
52. *Potentilla rivalis* N.: Douglas county.
53. *Prunus demissa* Walp.: Ellis county (Kellerman. Found on the Saline by Dr. Watson).
54. *Prunus gracilis* Eng. & Gray: Englewood (Kell.).
55. *Prunus pensylvanica* L.: Doniphan and Brown counties.
56. *Ribes oxyacanthoides* L.: Seneca.
57. *Sedum torreyi* Don: Labette.
58. *Circæa lutetiana* L.: Manhattan to Kansas City.
59. *Didiplis linearis* Raf.: Salina.
60. *Oenothera biennis* L., var. *grandiflora* Lindl.: Great Bend, Larned, Medicine Lodge.
61. *Oenothera canescens* Torr.: Russell and Ellis counties.
62. *Oenothera cæspitosa* N.: Ellis, Russell, and Barton counties.
63. *Oenothera coronopifolia* T. & G.: Wallace county.
64. *Epilobium angustifolium* L.: Doniphan and Atchison counties.
65. *Gaura sinuata*: Arkalon (Kellerman).
66. *Jussiaea repens* L.: Common in Pratt, Kingman, Harper, and Sumner counties.
67. *Myriophyllum spicatum* L.: Smith county.
68. *Mentzelia nuda* T. & G.: Sumner and Barber counties, and west and south from Clark, Gray, Finney, and Wallace counties.
69. *Mentzelia ornata* T. & G.: Caldwell, Medicine Lodge, Arkalon, Montezuma, Garden City.
70. *Cereus cæspitosus* Gray: Western Kansas.
71. *Cereus viridiflorus* Eng.: Grant county; Kearny county.
72. *Opuntia arborescens* Eng.: Stanton and Morton counties.
73. *Opuntia camanchica* Raf.: Morton county.
74. *Opuntia fragilis* Haw.: Stafford, Kiowa, Gray, and Grant counties.
75. *Cymopterus glomeratus* Raf.: Russell, Ellsworth, and Barton counties.
76. *Cymopterus montanus* T. & G.: Barton county and west.
77. *Hydrocotyle Americana* L.: Labette.
78. *Leptocalyx divaricatus* DC.: Englewood.
79. *Peucedanum villosum* Nutt.: Salina; Great Bend.
80. *Cornus sericea* L.: Council Grove.
81. *Symporicarpus racemosus* Mx.: Salina.
82. *Actinella linearifolia* T. & G.: Riley county and west; Meade county; Kearny county.
83. *Actinella odorata* Gr.: Ellsworth, Great Bend, Meade, Coolidge.
84. *Aplopappus divaricatus* Gr.: Barton and Stafford counties, and west.
85. *Aplopappus fremontii* Gray: Western Kansas.
86. *Aplopappus rubiginosus* T. & G.: Ellis county and west.
87. *Apogon humilis* Ell.: Seneca (escaped).
88. *Artemisia bigelovii* Gray: Grant county.

89. *Artemisia serrata* N.: Shawnee county.
90. *Aster canescens* Psh.: Ellis county.
91. *Aster cordifolius* L.: Jackson and Shawnee counties.
92. *Aster ericæfolius* Roth.: Russell and Barton counties, and westward.
93. *Aster linariifolius* L.: Great Bend, Greensburg, Ashland, Meade.
94. *Aster oblongifolius* N., var. *rigidulus* Gr.: Topeka, Manhattan.
95. *Aster pauciflorus* N.: Rooks and Ellis counties.
96. *Aster tanacetifolius* HBK.: Medicine Lodge, Meade, Montezuma, Coolidge.
97. *Baccharis salicina* T. & G.: Hutchinson, and on the headwaters of the Ninnescah. (The only shrub of the sunflower family in Kansas. A veritable sunflower tree.)
98. *Bahia oppositifolia* Nutt.: Ellis, Clark, and Meade counties.
99. *Berlandiera texana* DC.: Cherokee county.
100. *Bigelovia douglasii*, var. *serrulata* Gr.: Meade, Coolidge.
101. *Bigelovia engelmanni* Gr.: Wallace county.
102. *Centaurea americana* Nutt.: Montgomery county (Prof. Plank).
103. *Centaurea cyanus* L.: Montgomery county (Plank).
104. *Cichorium intybus* L.: Seneca (escaped).
105. *Chrysopsis pilosa* Nutt.: Emporia, Hutchinson.
106. *Chrysopsis villosa* N., var. *hispida* Gr.: Ellis, Hutchinson, Pratt, Arkalon, Garden City.
107. *Erigeron bellidiaster* Nutt.: Wallace, Garden City, Arkalon.
108. *Erigeron divergens* T. & G.: Finney county.
109. *Erigeron pumilus* Nutt.: Rooks county.
110. *Evax prolifera* N.: Ellis county and west.
111. *Flaveria angustifolia* Pers.: Wichita, Hutchinson, Great Bend, Dodge.
112. *Gaillardia simplex* Scheele: Independence.
113. *Haploesthes greggii* Gray: Arkalon.
114. *Helianthus annuus* L.: Kansas.
115. *Helianthus occidentalis* Ridd.: Shawnee county.
116. *Hymenopappus corymbosus* T. & G.: Clay county, Barton county.
117. *Lactuca acuminata* Gr.: La Cygne, Labette.
118. *Lactuca hirsuta* Muhl.: Shawnee county.
119. *Lactuca integrifolia* Bigel.: Shawnee county.
120. *Liatris acidota* Eng. & Gr.: Nemaha and Shawnee counties.
121. *Lygodesmia juncea* Don: Clay, Saline, Rice, and Barber counties, and west.
122. *Malacothrix sonchoides* T. & G.: Wallace.
123. *Marshallia cæspitosa* Nutt.: Sumner and Barber counties.
124. *Matricaria discoidea* DC.: Atchison (introduced).
125. *Melampodium cinereum* DC.: Meade and Finney counties.
126. *Polypterus hookeriana* Gr.: Arkalon and Garden City, in sand-hills.
127. *Polypterus hookeriana*, discoid or rayless form: Caldwell, Kiowa, Medicine Lodge, in gypsum bluffs.
128. *Prenanthes crepidinea* Mx.: Shawnee county.
129. *Pyrrhopappus scaposus* DC.: Ellis, Russell, and Barton counties.
130. *Riddellia tagetina* N.: Meade, Montezuma, and Garden City, and west.
131. *Senecio douglasii* DC.: Russell, Barton, Stafford and Pratt counties.
132. *Solidago bigelovii* Gr.: Arkansas City.
133. *Solidago lindheimeriana* Scheele: Independence.
134. *Solidago nemoralis* Ait., var. *incana* Gray: Nemaha, Riley, and Barton counties.
135. *Solidago riddellii* Frank.: Shawnee county.

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136. *Solidago speciosa* N., var. *angustata* T. & G.: Manhattan, Junction City, Thayer.
137. *Solidago speciosa*, var. *rigidiuscula* T. & G.: Topeka, Council Grove.
138. *Solidago tortifolia* Ell.: Topeka, Labette.
139. *Stephanomeria runcinata* Nutt.: Trego county.
140. *Tanacetum vulgare* L.: Lawrence, Topeka (escaping).
141. *Thelesperma ambigua* Gray: Western Kansas.
142. *Townsendia grandiflora* N.: Western Kansas.
143. *Troximon glaucum* Nutt.: Ellis.
144. *Verbesina encelioides* B. & H.: Miami county, Sumner county.
145. *Vernonia baldwinii* Torr.: Paola, Manhattan.
146. *Vernonia jamesii* T. & G.: Irving, Great Bend, Grant county.
147. *Xanthium canadense* Mill.: Manhattan (introduced).
148. *Zinnia grandiflora* Nutt.: Englewood, Liberal.
149. *Centunculus minimus* L.: Linn county.
150. *Glaux maritima* L.: Mitchell and Stafford counties, in salt marshes.
151. *Samolus valerandi* L., var. *Americanus* Gr.: Atchison county.
152. *Steironema lanceolata* Gray: Shawnee county.
153. *Pentstemon acuminatus* Dougl.: Manhattan, Ellis.
154. *Verbascum lychnitis* L.: Topeka.
155. *Verbena pinnatifida* Nutt.: Manhattan, Wichita.
156. *Verbena officinalis* L.: Lawrence, Topeka.
157. *Verbena paniculata* Lam.: Topeka.
158. *Lycopus rubellus* Moench: Shawnee county.
159. *Lycopus sinuatus* Ell.: Shawnee and Wabaunsee counties.
160. *Mentha arvensis* L.: Council Grove.
161. *Scutellaria resinosa* Torr.: Rooks county.
162. *Scutellaria versicolor* N.: Atchison.
163. *Euploca convolvulacea* Nutt.: Garden City, Montezuma, Arkalon.
164. *Kryniitzkia crassisepala* Gr.: Garden City, Coolidge.
165. *Kryniitzkia jamesii* Gray: Arkalon (Prof. Kellerman).
166. *Lithospermum arvense* L.: Topeka, Fontana, Pittsburg.
167. *Nemophila microcalyx* Fisch. & Mey.: Shawnee county.
168. *Phacelia integrifolia* L.: Medicine Lodge (Kellerman).
169. *Gilia longiflora* Don: Garden City, Coolidge, Arkalon.
170. *Chamæsaracha coronopus* Gray: Arkalon, Coolidge.
171. *Chamæsaracha sordida* Gray: Ashland, Ingalls, Wallace, west and south.
172. *Physalis angulata* L.: Lawrence, Topeka, and west.
173. *Physalis lanceolata* Mx., var. *hirta* Gray: Lawrence, Topeka, Manhattan.
174. *Physalis lanceolata*, var. *lævigata* Gr.: Lawrence, Topeka, Manhattan.
175. *Petunia violacea* L.: Topeka (escaping).
176. *Solanum heterodoxum* Dun.: Englewood, Arkalon.
177. *Solanum lycopersicum* L.: Topeka (escaping).
178. *Solanum torreyi* Gray: Paola.
179. *Solanum triflorum* Nutt.: Topeka.
180. *Asclepias arenaria* Torr.: Arkalon, Garden City, Montezuma.
181. *Asclepias brachystephana* Eng.: Rooks county.
182. *Asclepias jamesii* Torr.: Great Bend, St. John, Greensburg, Coldwater, and west.
183. *Asclepias stenophylla* Gr.: Manhattan, Garden City, Montezuma, Meade.
184. *Asclepiodora decumbens* Gray: Topeka, Council Grove.
185. *Asclepiodora viridis* Gr.: Manhattan, Salina, Great Bend.

186. *Gonolobus lœvis* Mx.: Mound City.  
187. *Abronia fragrans* Nutt.: Garden City, Montezuma, Arkalon.  
188. *Oxybaphus micrantha* Torr.: Great Bend, Greensburg.  
189. *Amarantus hypochondriacus* L.: Topeka (escaped slightly).  
190. *Amarantus viridis* L.: Topeka, Great Bend.  
191. *Atriplex arenaria* Nutt.: Great Bend.  
192. *Atriplex patula* L., var. *subspicata* Wats.: Barton, Stafford, and Reno counties.  
193. *Chenopodium glaucum* L.: Topeka.  
194. *Cladothrix lanuginosa* Nutt.: Salina, Great Bend.  
195. *Corispermum hyssopifolium* L.: Topeka, Hutchinson, Great Bend.  
196. *Salicornia herbacea* L.: Cawker City, Great Bend.  
197. *Suaeda depressa* Ledeb.: Great Bend.  
198. *Eriogonum longifolium* N.: Arkalon (Prof. Kellerman).  
199. *Eriogonum microthecum* N.: Finney county, Grant county.  
200. *Eriogonum microthecum*, var. *effusum* T. & G.: Barton and Stafford counties.  
201. *Fagopyrum esculentum* Moench: Topeka (trying to naturalize).  
202. *Polygonum ciliinode* Mx.: Shawnee county.  
203. *Polygonum dumetorum* L., var. *scandens* Gr.: Shawnee county.  
204. *Polygonum lapathifolium* L.: Shawnee county.  
205. *Polygonum muhlenbergii* Wats.: Shawnee county, Riley county.  
206. *Polygonum orientale* L.: Topeka (escaped).  
207. *Rumex Claytoni* Campd.: Kaw bottoms, Lawrence to Salina.  
208. *Comandra pallida* A.DC.: Grant county; Barber county.  
209. *Acalypha caroliniana* Walt.: Manhattan.  
210. *Argyrothamnia humilis* Müll.: Garden City.  
211. *Croton texensis* Müll.: Ellis, Great Bend, Pratt, south and west.  
212. *Crotonopsis linearis* Mx.: Lawrence; Topeka.  
213. *Euphorbia cyparissias* L.: Topeka (running out).  
214. *Euphorbia lata* Eng.: Chalk cliffs of Meade county.  
215. *Euphorbia preslii* Guss.: Kansas City to Salina and Cherokee county.  
216. *Cannabis sativa* L.: Lawrence, Topeka, Manhattan, Salina (perfectly naturalized).  
217. *Alnus incana* Willd.: Johnson and Miami counties.  
218. *Carpinus americana* Walt.: Miami and Linn counties.  
219. *Salix cordata* Muhl., var. *vestita* Andersson: Manhattan.  
220. *Salix fragilis* L., var.: Topeka.  
221. *Arisæma polymorphum* Buckl.: Seneca; Topeka; Manhattan.  
222. *Sparganium simplex* Huds., var. *androcladum* Eng.: Shawnee county.  
223. *Scheuchzeria palustris* L.: Salina.  
224. *Triglochin maritima* L.: Salina.  
225. *Limnobium spongia* Rich.: Johnson county.  
226. *Vallisneria spiralis* L.: Miami county.  
227. *Agave virginica* L.: Labette and Montgomery counties (Plank).  
228. *Cooperia drummondii* Herbert: Montgomery county (Plank).  
229. *Iris versicolor* L.: Seneca; Atchison; Kansas City, Kas.  
230. *Nemastylis geminiflora* Nutt.: Humboldt; Thayer.  
231. *Asparagus officinalis* L.: Seneca, Topeka (escaping slightly).  
232. *Camassia esculenta* Torr.: Nemaha, Wabaunsee, and Morris counties.  
233. *Erythronium americanum* Sm.: Topeka, Manhattan.  
234. *Hemerocallis fulva* L.: Topeka (escaped slightly).

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- 235. *Lilium philadelphicum* L.: Troy; Atchison.
  - 236. *Lilium tigrinum* Ker: Topeka, Great Bend (escaping).
  - 237. *Oakesia sessifolia* Wats.: Atchison; Leavenworth; Lawrence.
  - 238. *Zygadenus nuttallii* Gray: Onaga; Manhattan; Council Grove.
  - 239. *Juncus canadensis* J. Gay: Douglas and Shawnee counties.
  - 240. *Juncus filiformis* L.: Topeka.
  - 241. *Luzula campestris* DC.: Troy.
  - 242. *Carex crus-corvi* Shutt.: Topeka.
  - 243. *Carex filiformis* L.: Salina.
  - 244. *Carex gravida* Bailey: Topeka.
  - 245. *Carex longirostris* Torr.: Seneca.
  - 246. *Carex tenella* Schkuhr: Topeka.
  - 247. *Carex tetanica* Schk., var. *Meadii* Bailey: Miami county.
  - 248. *Carex triceps* Mx., var. *hirsuta* Bail.: Topeka.
  - 249. *Cladium mariscoides* Torr.: Topeka, Great Bend.
  - 250. *Cyperus inflexus* Muhl.: Topeka, Great Bend.
  - 251. *Cyperus rotundus* L.: Topeka, Great Bend.
  - 252. *Eleocharis ovata* R. Brown: Topeka, Manhattan, Great Bend.
  - 253. *Eriophorum lineatum* B. & H.: Topeka.
  - 254. *Eriophorum virginicum* L.: Topeka.
  - 255. *Rhynchospora capillacea* Torr.: Lawrence, Topeka.
  - 256. *Scleria verticillata* Muhl.: Topeka, Manhattan.
  - 257. *Agropyrum caninum* Roemer & Schultes: Manhattan.
  - 258. *Agropyrum tenerum* Vasey: Topeka, Manhattan, Great Bend.
  - 259. *Agrostis exarata* Trin.: Topeka, Manhattan.
  - 260. *Agrostis perennans* Tuck.: Topeka, Manhattan.
  - 261. *Alopecurus pratensis* L.: Topeka, Manhattan.
  - 262. *Ammophila longifolia* Benth.: Barton and Stafford counties; Finney county.
  - 263. *Andropogon hallii* Hack.: Garden City, Montezuma, Meade, and west.
  - 264. *Andropogon laguroides* DC.: Great Bend, Kinsley.
  - 265. *Andropogon macrorrhizus* Mx.: Stafford, Pratt, Barber counties, and west.
  - 266. *Andropogon saccharoides* Swz.: Salina, Hutchinson, Medicine Lodge, and west.
  - 267. *Andropogon virginicus* L.: Ellis, Great Bend, Pratt, and west.
  - 268. *Anthoxanthum odoratum* L.: Topeka, Manhattan (trying to escape).
  - 269. *Aristida basiramea* Eng.: Seneca, Salina.
  - 270. *Aristida purpurea* N., var. *longiseta* Vasey: Salina, Great Bend.
  - 271. *Aristida ramosissima* Eng.: Salina, Fort Scott.
  - 272. *Aristida stricta* Mx.: Manhattan, Salina.
  - 273. *Aristida tuberculosa* Nutt.: Salina.
  - 274. *Asprella hystrix* Willd.: Lawrence, Salina.
  - 275. *Bouteloua racemosa* Lag., var. *aristosa* Gray: Kaw valley, Council Grove, Great Bend.
  - 276. *Brachyelytrum aristatum* Beauv.: Lawrence.
  - 277. *Brachyelytrum aristatum*, var. *Engelmannii* Gray: Topeka, Manhattan.
  - 278. *Bromus ciliatus* L., var. *minor* Munro: Salina.
  - 279. *Bromus kalmii* Gr.: Topeka, Manhattan, Council Grove.
  - 280. *Bromus mollis* L.: Topeka, Manhattan (introduced).
  - 281. *Bromus unioloides* Willd.: (Kellerman).
  - 282. *Danthonia spicata* Beauv.: Topeka, Manhattan.
  - 283. *Deschampsia flexuosa* Griseb.: Topeka; Manhattan; Salina.
  - 284. *Deyeuxia confinis* Kth.: Topeka.

285. *Diplachne rigida* Vasey: Arkalon (Prof. Kellerman).  
286. *Distichlis maritima* Raf., var. *stricta* Thurb.: Hutchinson, Garden City.  
287. *Eragrostis frankii* Meyer: Hutchinson; Pratt; Ashland; Arkalon; Montezuma; Garden City.  
288. *Eriochloa polystachya* HBK.: Caldwell; Kiowa; Arkalon.  
289. *Eriochloa punctata* Ham.: Medicine Lodge (Kellerman).  
290. *Festuca elatior* L., var. *pratensis* Gr.: Topeka, Manhattan (introduced).  
291. *Festuca nutans* Willd., var. *Shortii* Wats.: Southeastern Kansas (Kellerman).  
292. *Glyceria fluitans* R. Br.: Manhattan.  
293. *Glyceria grandis* Wats.: Lawrence; Topeka; Manhattan.  
294. *Gymnopogon racemosus* Beauv.: Independence.  
295. *Hordeum pusillum* Nutt. (not *nodosum* L.): Topeka; Manhattan.  
296. *Koeleria cristata* Pers., var. *gracilis* Gray: Council Grove; Great Bend.  
297. *Lolium perenne* L.: Manhattan (introduced).  
298. *Melica diffusa* Psh.: Topeka, Manhattan.  
299. *Muhlenbergia capillaris* Kth.: Independence.  
300. *Muhlenbergia comata* Benth.: Garden City, north and west.  
301. *Muhlenbergia debilis* Thurb.: Arkalon.  
302. *Muhlenbergia pungens* Thurb.: Wallace, Garden City.  
303. *Panicum crus-galli* L., var. *hispidum* Gr.: Kaw valley; Neosho valley; Arkansas valley.  
304. *Panicum crus-galli*, var. *hispidum*, forma *atropurpureum*: Irving; Topeka; Hutchinson; Great Bend.  
305. *Panicum crus-galli*, var. *muticum* Gr.: Hutchinson; Great Bend; Garden City; Arkalon.  
306. *Panicum crus-galli*, var. *muticum*, forma *purpureum variegatum*: Golden, Grant county. (Leaves beautifully banded with purple bands two-thirds of a millimetre wide and about one millimetre apart.)  
307. *Panicum crus-galli*, var. *Walteri*: Mound City; Oswego; Arkansas City.  
308. *Panicum dichotomum* L., var. *gracile* Gr.: Wichita.  
309. *Panicum filiforme* L.: Topeka.  
310. *Panicum microcarpon* Muhl.: Topeka.  
311. *Pappophorum apertum* Munro: Garden City and west.  
312. *Paspalum virgatum* L., var. *latifolium* Wood: Wichita.  
313. *Paspalum virgatum* L., var. *platyoxon* Doell: Cherokee county.  
314. *Phalaris intermedia* Bosc.: Oswego.  
315. *Phleum pratense* L., Topeka; Manhattan (escaping sparingly).  
316. *Poa alsodes* Gray: Seneca; Topeka; Manhattan.  
317. *Poa andina* Nutt.: Salina (Prof. Kellerman).  
318. *Poa flexuosa* Muhl.: Lawrence; Topeka; Manhattan.  
319. *Puccinellia airoides* Parlatore: Topeka; Manhattan.  
320. *Puccinellia distans* Parl.: Manhattan.  
321. *Redfieldia flexuosa* Vasey: Garden City, west and south.  
322. *Setaria germanica* Beauv.: Topeka; Manhattan (becoming naturalized, but degenerating in the process).  
323. *Setaria perennis* (Hall & Henry?) Salina; Hutchinson; Dodge City; Garden City; Arkalon.  
324. *Sorghum halepense* L.: Paola; Garden City (running wild on Government farm).  
325. *Spartina gracilis* Trin.: Wichita; Hutchinson.  
326. *Spartina polystachya* Willd.: Salina (Henry).  
327. *Sporobolus arkansanus* Trin.: Arkalon (Kellerman).

328. *Sporobolus asperifolius* Thurb.: Ellis and Dodge City, south and west.  
 329. *Sporobolus confusus* Vasey: Garden City, south and west.  
 330. *Sporobolus indicus* R. Br.: Lawrence.  
 331. *Stipa avenacea* L.: Topeka, Lawrence.  
 332. *Stipa comata* Trin. & Rupr.: Arkalon (Kellerman).  
 333. *Stipa viridula* Trin.: Topeka, Manhattan.  
 334. *Tripsacum dactyloides* L., var. *monostachyon* Gr.: Salina, Great Bend.  
 335. *Trisetum interruptum* Buckl.: Arkalon.

## FERNs AND FILICOID PLANTS.

Collections of ferns have been made principally by Prof. F. W. Cragin, of Washburn College, assisted by Mrs. Cragin and students of Washburn College.

336. *Equisetum limosum* L.: Hutchinson, Great Bend.  
 337. *Equisetum limosum*, var. *polystachyum* Brück.: Great Bend.  
 338. *Aspidium marginale* Swz. Shield Fern: Crevices of rocks, Neosho and Walnut valleys; plentiful.  
 339. *Aspidium thelypteris* Swz. Marsh Fern: Ravines, Jackson county; rare.  
 340. *Asplenium ebeneum* Ait.: Base of mossy rocks, southeastern Kansas; occasional.  
 341. *Asplenium parvulum* Mart & Gale: Cowley county; occasional.  
 342. *Asplenium trichomanes* Link: Crevices of limestone rock, Woodson county; not common.  
 343. *Cheilanthes lanuginosa* N. Lip Fern: Ottawa and Barton counties; quite rare. (Found at "Rock City," Ottawa county, by Mrs. C. S. Mason, and sandstone bluffs along Cow creek, in northern Barton county, by Mrs. D. J. Evans.)  
 344. *Cheilanthes vestita* Swz. Lip Fern: About moss-covered rocks, Woodson county; frequent.  
 345. *Notholæna dealbata* Kunze. Calcimine Fern: Northeast face limestone bluffs, lower Kaw, Osage, Neosho, Verdigris, and Walnut valleys; quite rare.  
 346. *Notholæna nivea* Desvaux. Little Snowy Fern: Reported from Neosho county.  
 347. *Pellea wrightiana* Hook. Wright's Cliff Brake: Limestone bluffs, Ottawa county; very rare (Cragin).  
 348. *Phegopteris dryopteris* Fee. Ternate Rock Fern: Cliffs, Morris county; rare.  
 349. *Phegopteris hexagonoptera* Fee. Beech Fern: Linn county; very rare.  
 350. *Polypodium vulgare* L. Rock Polypod: Shady rock sides, Morris county; not common (Smyth).  
 351. *Lycopodium clavatum* L.: Reported from Jewell county (doubtful).

## MOSSES.

A preliminary list of mosses of the State is here presented, in the hope that it may lead to a more careful study of that interesting branch of botany on the part of some of the students of the State. The principal collectors in mosses are:

Mrs. E. H. Newman, No. 14 Woodlawn avenue, Potwin Place, Topeka; Prof. F. W. and Mrs. Cragin, Washburn College, Topeka; Jerry M. Fields, Alma, Wabaunsee Co.; S. A. Baldwin, Wabaunsee; Miss Mara Becker, Netawaka, Jackson Co.; J. D. Hatcher, Long Island, Phillips Co.; Joseph Henry, Salina (since died); Dr. W. S. Newlon, Oswego; Prof. J. H. Carruth, Lawrence; Rev. John Bennett, Kansas City, Kan.

The principal authority is Eugene A. Rau, Stony Creek, Pa., as published in the Bulletins of Washburn College Laboratory of Natural History, with a few additions on the authority of Prof. Elihu Hall, of Athens, Ill., Prof. Leo Lesquereux, Columbus, O., both now dead, and Prof. T. C. Porter, Lafayette College, Easton, Pa., also a few original collections.

*Acrocarpi*.—Fruit terminal.

PHASCACEÆ.—Capsule sessile.

- 352. *Ephemerum spinulosum* Bruch & Schimper. Moist clay ground; common.
- 353. *Phascum carniolicum* Weber & Mohr. Sandy ground, western Kansas (Prof. E. Hall.)
- 354. *Phascum cuspidatum* Schreber. Dry soil, along fences, etc., eastern Kansas.
- 355. *Phascum cuspidatum*, var. *piliferum* Bruch & Schimp. Same habitat.

FUNARIACEÆ.—Capsule nodding, gibbous. Calyptra tetragonal. Peristome none or of 16 teeth, twisted to the right, sometimes with a slight inner membrane.

- 356. *Physcomitrium acuminatum* Bruch & Schimp. Moist ground; northern Kansas. (Rau.)

- 357. *Physcomitrium pyriforme* Brid. Prairies, eastern Kansas, very common; fruits in spring.

- 357. *Physcomitrium tetragonum* Bruch & Schimp. Sandy plains, western Kansas (Prof. Hall.).

- 358. *Funaria hygrometrica* Sibthorpe. Bare, moist sandy ground, eastern Kansas; common.

POTTIACEÆ.—Capsule narrowly oval or cylindrical. Peristome of 16 flat teeth, bifid, or divided into 32 terete filiform segments, often twisted.

- 359. *Barbula cæspitosa* Schwaegrichen. Tree roots on hillsides; common.

- 360. *Barbula fallax* Hedw. Rocks, earth, etc.; frequent.

- 361. *Barbula henrici* E. A. Rau, n. sp. (Bull. Wash. Coll. Lab. Nat. Hist. I, 172): "Diœcious? plants short, branched, closely cespitose, canescent from the white excurrent costæ; leaves concave, short spatulate; costæ keeled, filamentose, near apex of leaf, excurrent portion as long as the leaf, hyaline, serrate; areolation of leaves quadrate and chlorophyllose above, hyaline and elongated toward the base; leaves spreading when moist, imbricated when dry. Habitat: Rocks, Saline county (Joseph Henry). Although without fruit, it appears to be a distinct species belonging to the section Chloronotæ. It differs from *Barbula chloronotos*, Bruch, in its more canescent appearance, shorter and more obtuse leaves, laxer areolation, longer excurrent and more serrate costæ. Plants bearing archægonia only were sent; it is therefore desirable to secure fruiting specimens to complete the diagnosis."

- 362. *Barbula mucronifolia* Bruch & Schimp. Lime-rocks; frequent.

- 363. *Barbula unguiculata* Hedw. Damp loam, rocks, etc.; common.

- 365. *Pharomitrium subsessile* Schimp. Open ground, stone walls, etc.; frequent.

- 366. *Didymodon rubellus* Bruch & Schimp. Stones and ground, near water; frequent.

- 367. *Leptotrichum pallidum* Hampe. Bare earth in woods; common.

- 368. *Leptotrichum tortile* Muell., var. *vaginans* Lesquereux. Clayey and sandy soils; common.

- 369. *Trichostomum tophaceum* Brid. Moist lime-rocks; common.

DICRANACEÆ.—Capsule long-pedicelled, erect or nodding. Calyptra cucullate. Operculum rostrate. Peristome simple, of 16 flat entire or bifid teeth, or none.

- 370. *Weisia viridula* Bridel. On ground, eastern Kansas.

- 371. *Weisia viridula*, var. *stenocarpa* Muell. Topeka.

- 372. *Dicranella heteromalla* Schimp. Rocks, clay banks; common.

- 373. *Dicranella rufescens* Schimp. Clay banks; frequent.

- 374. *Dicranella varia* Schimp. Damp banks, eastern Kansas; common.

375. *Dicranum scoparium* Hedwig. Southeastern Kansas (Dr. W. S. Newlon).  
 376. *Dicranum undulatum* Turner. Damp shades; common.  
 377. *Campylopus leanus* Sullivan. Soft, damp, woody earth; occasional.  
 378. *Campylopus henrici* Cardot, n. sp. (*Botan. Gazette*, August, 1888.) Saline county (Henry).  
 379. *Fissidens decipiens* DeNot. Lime-rocks, etc.; frequent.  
 380. *Fissidens exiguum* Sulliv. Stones in moist and shaded banks, etc.; common.  
 381. *Fissidens minutulus* Sull. Moist rocks in shady woods and banks; common.  
 382. *Fissidens osmundioides* Hedw. Northeastern Kansas (Miss Mara Becker).  
 383. *Fissidens taxifolius* Hedw. Shaded, clayey ground; common.  
 384. *Leucobryum minus* Sull. Bluff ground in woods; June; frequent.  
 385. *Leucobryum vulgare* Hampe. Roots of trees in damp woods; February; common.  
 386. *Ceratodon purpureus* Brid. Common.  
 387. *Seligeria pusilla* Bruch & Schimp. Shaded limestone rocks, eastern Kansas.

**GRIMMIACEÆ.**—Plants tufted. Capsule symmetrical, on a straight or curved pedicel. Calyptra mitriform. Peristome simple, of 16 transversely articulate teeth, or double; the outer of 8 bigeminate or 16 geminate teeth, the inner of 8 or 16 simple filiform cilia or lancolate segments.

388. *Grimmia apocarpa* Hedw. Damp rocks, walls, etc.; common.  
 389. *Grimmia apocarpa*, var. *rivularis* Nees & Hornschuch. Rocks in water-courses, eastern Kansas.  
 390. *Grimmia calyptata* Hook.  
 391. *Grimmia conferta* Funck, var. *obtusifolia* Schimp. Face of dry, shaded rocks; common.  
 392. *Grimmia conferta*, var. *compacta* Lesq. Same habitat.  
 393. *Grimmia leucophæa* Grevius. Dry sandstone rocks; frequent.  
 394. *Grimmia pennsylvanica* Schwaegr. Rocks; common.  
 395. *Hedwigia ciliata* Ehrh. Shaded or moist sandstone rocks; occasional.  
 396. *Ptychomitrium incurvum* Sull. Sand-rocks, southeastern Kansas.  
 397. *Ptychomitrium pygmæum* Lesq. & James. Stones near streams, southeastern Kansas (Prof. Hall).  
 398. *Orthotrichum anomalum* Hedw. Lime-rocks.  
 399. *Orthotrichum brachythecium* Schimp. Trees; not common.  
 400. *Orthotrichum cupulatum* G. F. Hoffmann. Limestone rocks, western Kansas.  
 401. *Orthotrichum speciosum* Nees. Tree trunks; common.  
 402. *Orthotrichum strangulatum* Beauv. Trees; common.

**BRYACEÆ.**—Capsule globose, ovoid, or pyriform; nodding, horizontal, or pendent. Peristome double; teeth barred; segments of inner membrane separated by cilia.

403. *Bartramia pomiformis* Hedw. Banks, southeastern Kansas; rare.  
 404. *Philonotis muhlenbergii* Brid. Springs in sand-hills, central Kansas; frequent. (E. A. Rau.)  
 405. *Webera albicans* Schimp. Damp sand, near water, northeastern Kansas (Miss Becker).  
 406. *Webera annotina* Schwaegr. Woods, eastern Kansas; not common.  
 407. *Bryum argenteum* Linn. Shades of hedges, etc., eastern Kansas; common.  
 408. *Bryum bimatum* Schreb. Damp, sandy ground, rocks, eastern Kansas. (Rau.)  
 409. *Bryum cæspiticium* Linn. Common.  
 410. *Bryum pendulum* Schimp. Dead trunks; frequent.

411. *Bryum pseudotriquetrum* Schwaegr. Wet rocks, eastern Kansas.  
 412. *Mnium affine* Bland. Shaded banks; common.  
 413. *Mnium cuspidatum* Hedw. Damp ground, eastern Kansas; common.

**POLYTRICHACEÆ.**—Plants woody. Capsule cylindrical or angular. Calyptra hairy. Peristome of 32 or 64 solid teeth.

414. *Atrichum angustatum* B. & S. Gravelly soil in woods; common. (Rau.)  
 415. *Atrichum undulatum* Beauv. Woods, eastern Kansas.  
 416. *Polytrichum commune* Linn. Northeastern Kansas.  
 417. *Polytrichum juniperinum* Willd. Prairies, western Kansas.  
 418. *Polytrichum piliferum* Schreb. Sandy ground, western Kansas.

*Pleurocarpi*.—Fruit lateral.

**LESKEACEÆ.**—Capsule cylindrical or oblong, erect or curved. Peristome double, the outer of 16 long teeth, the inner of 16 cilia.

419. *Thelia asprella* Sull. Base of trees, common.  
 420. *Leskeia polycarpa* Ehrh. Base of trees, eastern Kansas, freq.; limestone bluffs, northern Kansas. (Rau.)  
 421. *Leskeia rostrata* Hedw. Woods, eastern Kansas, not common. (Rau.)  
 422. *Anomodon attenuatus* Hueben. Base of trees in bottoms, common.  
 423. *Anomodon obtusifolius* B. & S. Trunks of trees near water, common.  
 424. *Anomodon rostratus* Schimp. Roots of trees, eastern Kansas, frequent.  
 425. *Pylaisia intricata* B. & S. Old trees, common.  
 426. *Pylaisia velutina* B. & S. Bark of trees and old logs.  
 427. *Cylindrothecium cladorrhizans* Schimp. Dead logs and roots of trees, common.  
 428. *Cylindrothecium seductrix* Sull. Logs in shady woods, common.

**HYPNACEÆ.**—Capsule long-pedicled, more or less nodding. Calyptra cuculate. Peristome double; the outer of 16 lanceolate teeth, the inner a membrane divided into 16 carinate segments.

429. *Brachythecium acuminatum*, var. *setosum*. Foot of trees, dead logs, etc., eastern Kansas.

430. *Brachythecium lœtum* B. & S. Roots and logs in woods, eastern Kansas, frequent.

431. *Brachythecium plumosum* B. & S. Moist rocks, eastern Kansas. (Rau.)  
 432. *Brachythecium rivulare* B. & S. Moist woods, eastern Kansas. (Rau.)  
 433. *Brachythecium rutabulum* B. & S., var. Shaded ground, roots of trees, etc.  
 434. *Brachythecium salebrosum*, var. *longisetum* B. & S. Moist ground, decayed logs, in woods.

435. *Eurhynchium hians* B. & S. Shady banks, common.  
 436. *Eurhynchium strigosum* B. & S. Sandy shades, eastern Kansas.  
 437. *Rhynchostegium rusciforme*, var. *inundatum* B. & S. Stones in streams.  
 438. *Rhynchostegium serrulatum* Schimp. Dry woods, eastern Kansas. (Rau.)  
 439. *Plagiothecium sylvaticum* B. & S. Rocks in dense shady spots, eastern Kansas.

440. *Amblystegium radicale* B. & S. Decayed logs in shade, eastern Kansas.  
 441. *Amblystegium riparium* B. & S. Stones, decayed wood, etc., in standing water, northeast Kansas.

442. *Amblystegium riparium*, var. *cariosum* Sull. Saline county. (Rau.)  
 443. *Amblystegium serpens* B. & S. Decayed wood, moist earth, and stones in shade, eastern Kansas.

444. *Campylium chrysophyllum*. Moist ground, dead wood, roots of trees, etc., southeast Kansas.

445. *Campylium hispidulum* Mitten. Ground, dead wood, etc., eastern Kansas.  
(Rau.)

446. *Hypnum aduncum* Hedw. var. Damp ground, central Kansas. (Rau.)

447. *Hypnum curvifolium* Hedw. Dead logs in shady woods, common.

These 447 species of plants in Kansas, added to the 1,355 already published, makes a total of 1,802 plants, not including hepaticæ, fungi, lichens, or algæ. The totals thus far are 1,666 flowering plants, 40 ferns and filicoid plants, and 96 mosses. The largest order by far is the Compositæ, embracing 292 species; next in size is the grasses, comprising 204 species; and following that is the Leguminosæ, consisting of 128 species. Other orders, except the Cyperaceæ, are less than 100. The future may reduce slightly, but will probably increase, these numbers. The work is by no means ended. There is more to come.

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#### EXPERIMENTS IN 1890 FOR THE ARTIFICIAL DISSEMINATION OF CONTAGIOUS DISEASES AMONG CHINCH-BUGS.

BY F. H. SNOW, LAWRENCE.

At the last meeting of this Academy, at Wichita, in October, 1889, the writer presented an account of his experiments in 1889 for the artificial introduction of contagious diseases among chinch-bugs. These experiments have been continued from the date of that meeting up to the present time (November, 1890).

Inasmuch as these maladies of the chinch-bug are not kept alive in the field under ordinary out-of-door conditions of the winter season, the next important point to be gained was their preservation through the winter in the laboratory, in order that they might be under control and be available for use in the season of 1890. To accomplish this result, I placed fresh, healthy bugs in the infection jar late in November, 1889, and was pleased to note that they contracted disease and died in the same way as in the earlier part of the season. I was not able to obtain fresh germs in the spring of 1890 until the month of April, and then only a limited supply of live bugs could be secured. I quote the following from my laboratory notes:

"April 10th, twenty-five chinch-bugs that had hibernated in the field were put in the infection jars. They were supplied with young wheat plants. The bugs appeared lively and healthy.

"April 16th, some of the bugs were dead, and all appeared stupid.

"April 20th, all of the bugs were dead.

"One week later a new supply of fourteen bugs was put into the jar; they were supplied with growing wheat. They ran substantially the same course as the first twenty-five. Some had died at the end of the first week, and all were dead by the end of the thirteenth day."

The chinch-bug seemed to have been very generally exterminated in Kansas in 1889, and only three applications for diseased bugs were received in 1890 up to the middle of July. On account of the limited amount of infection material on hand, I required each applicant to send me a box of live bugs, which I placed in the infection jars, returning in a few days a portion of the sick bugs to the sender. The three applicants above noted reported the complete success of the experiments. I